

LIFEFLIGHT OF MAINE



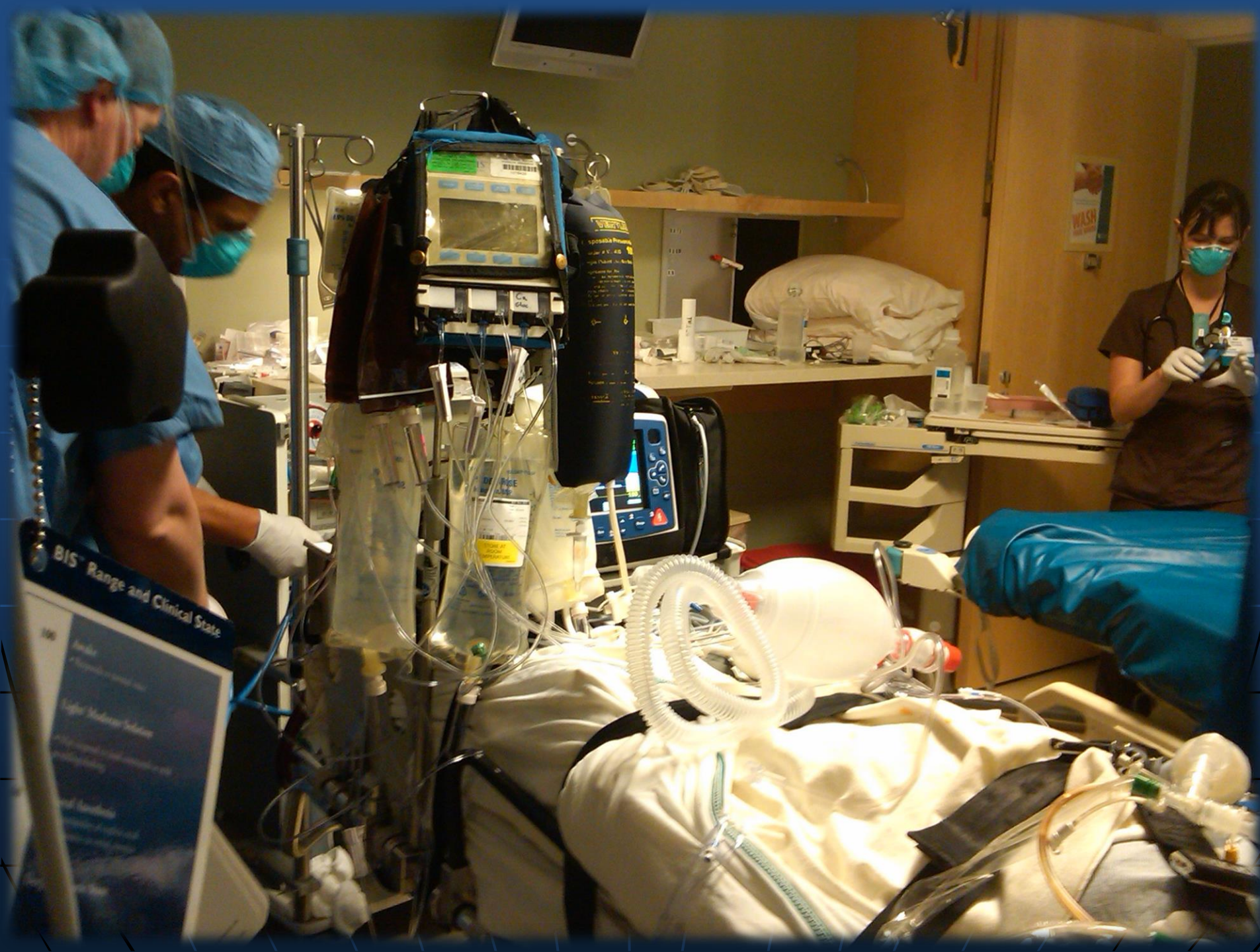
LifeFlight:

- Background
- Managing Time
- Resources
- Future



Critical Care





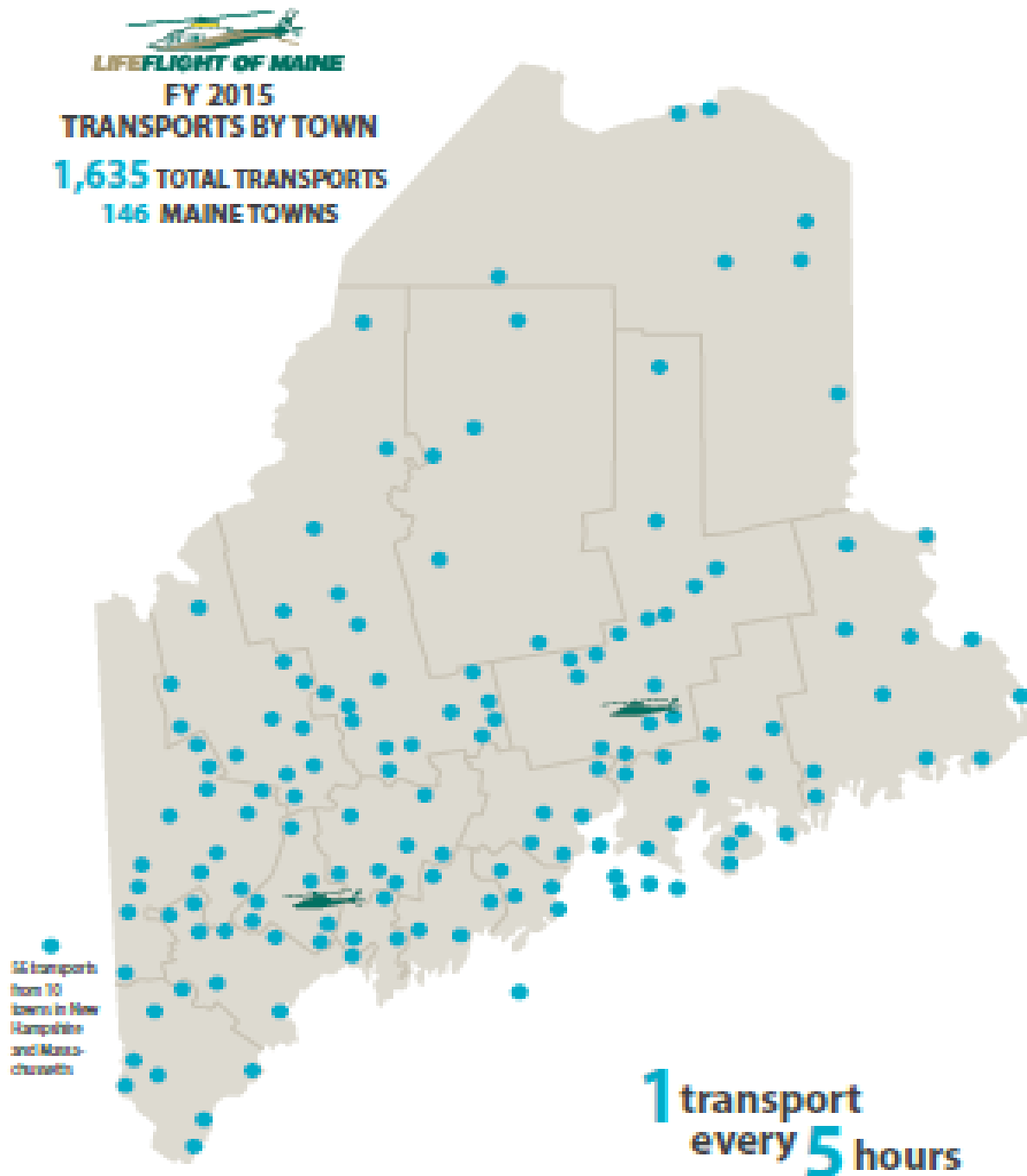
BIS[®] Range and Clinical State

100
Index
of Hypnosis
Light/Moderate Sedation
Deep Sedation/General Anesthesia
BIS[®] 1-4
BIS[®] 5-6
BIS[®] 7-8
BIS[®] 9-10

LifeFlight of Maine

- Established 1998
- Healthcare system owned / hospital based
- Independent business unit
- Private non-profit charity w/ associated Foundation
- Unique healthcare provider statewide service /24 /365
- Significant capital costs for resources— aircraft, medical technology, infrastructure
- Variable / uneven reimbursement for services

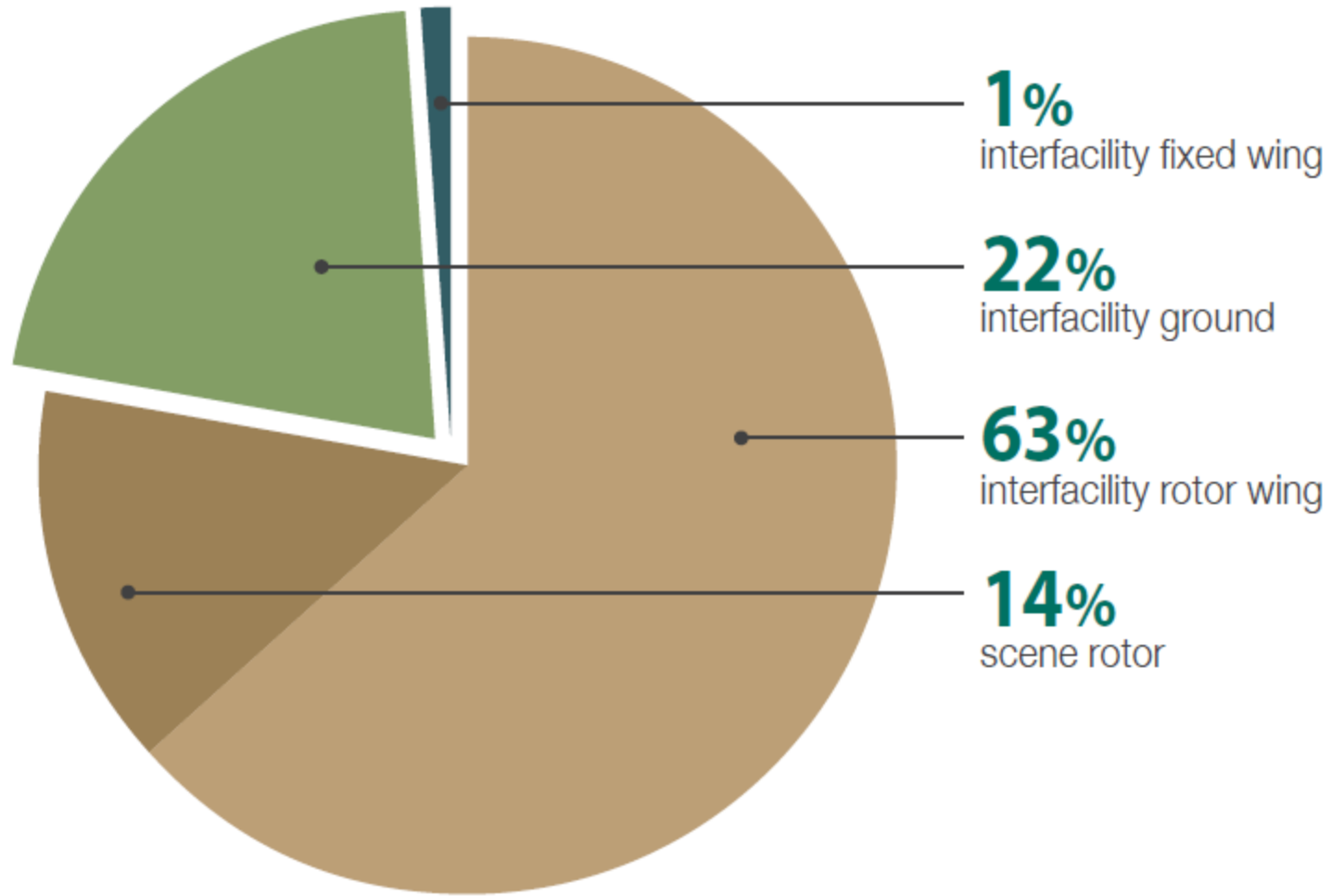




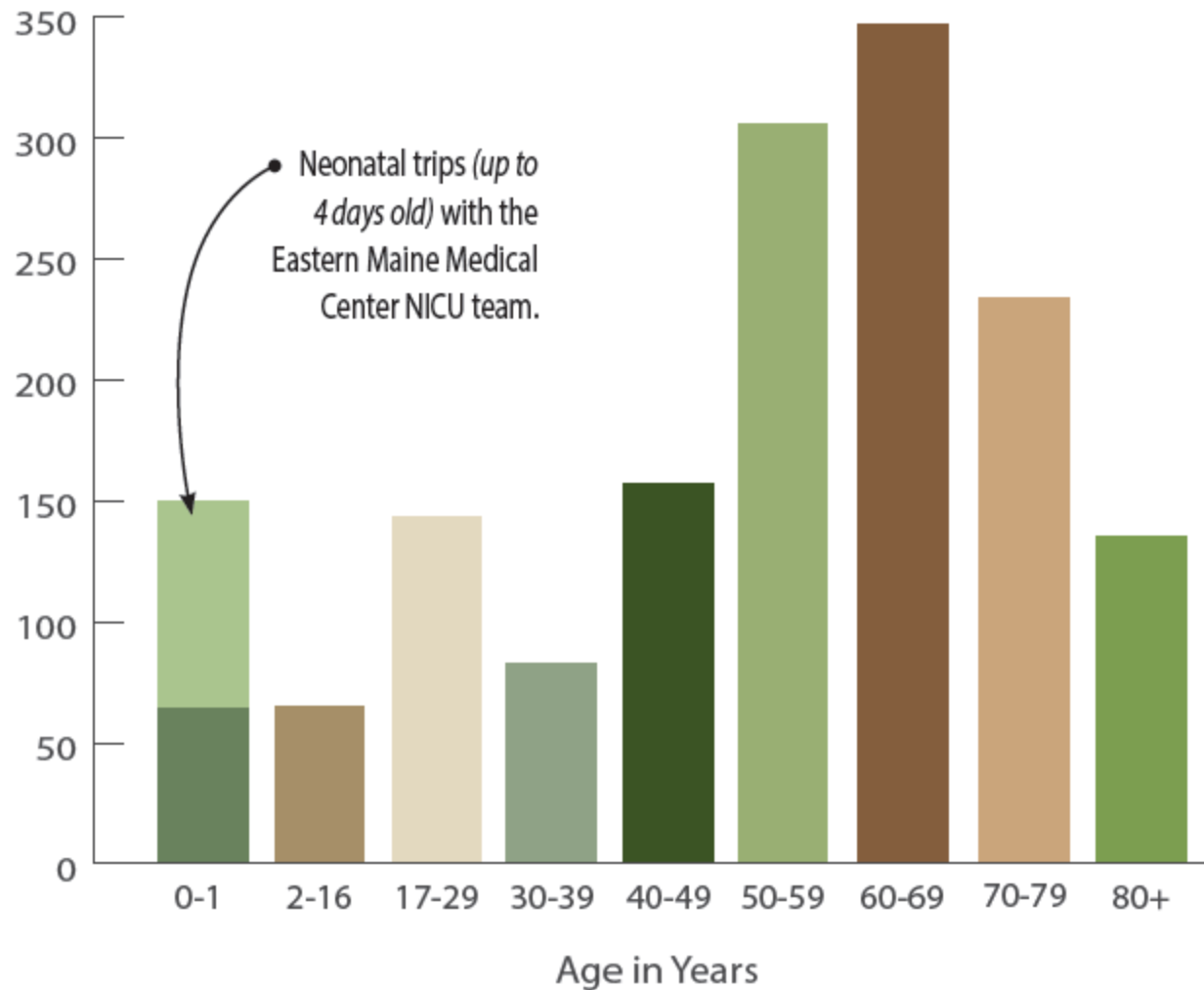
FY15: 1635 patients

- 146 ME POP's
States, 3 Canadian
Provinces ,France,
Germany,
- 56 mutual aid
NEAA
- 57 referring and 26
receiving hospitals
- 89 % to EMMC,
MMC, CMMC
- 9 % to Boston
- 267 patients not
served due to
resource issues
- Weather impact 492
patient requests

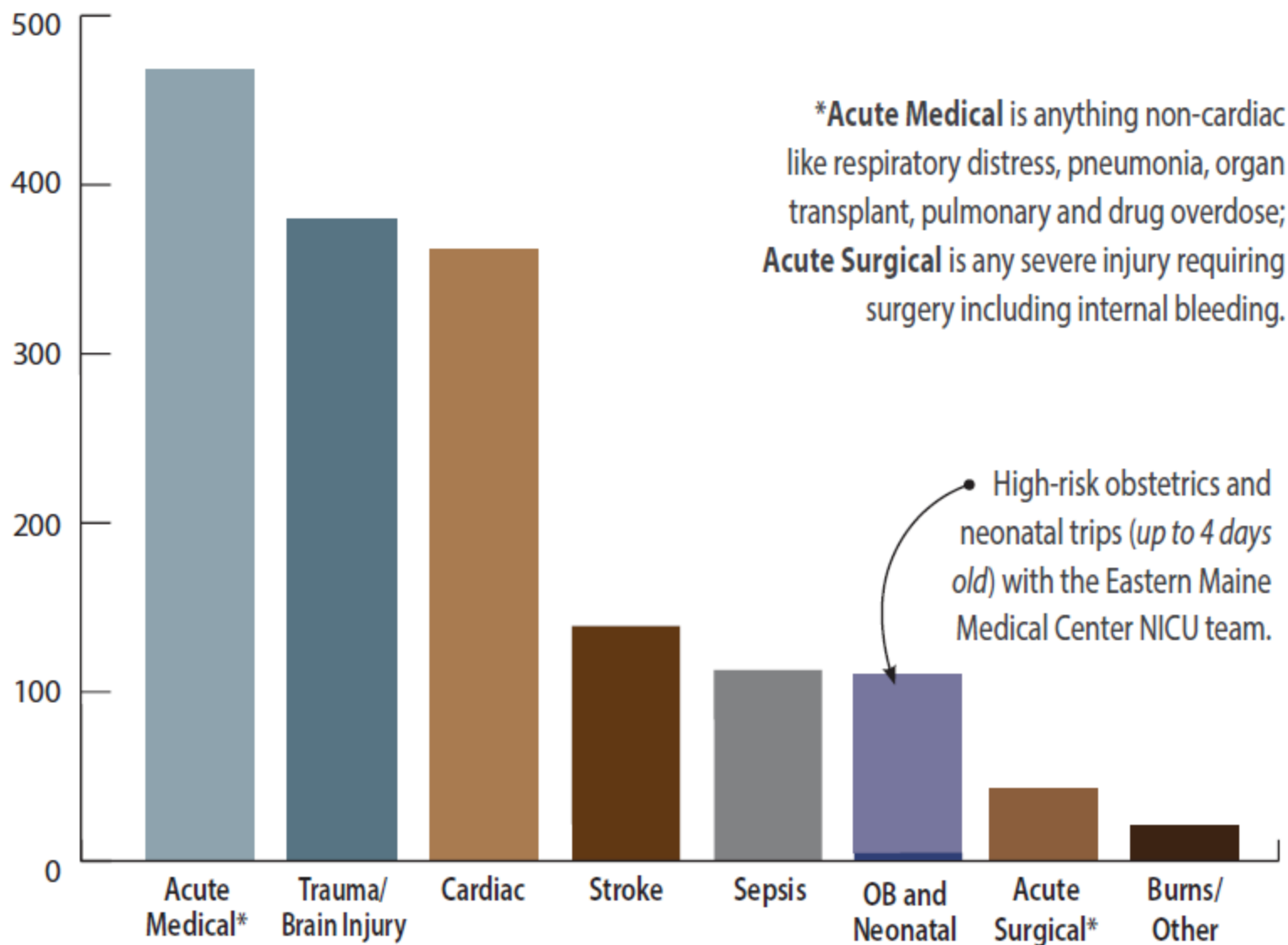
Types of Transport in FY15



Patient Age Distribution in FY15

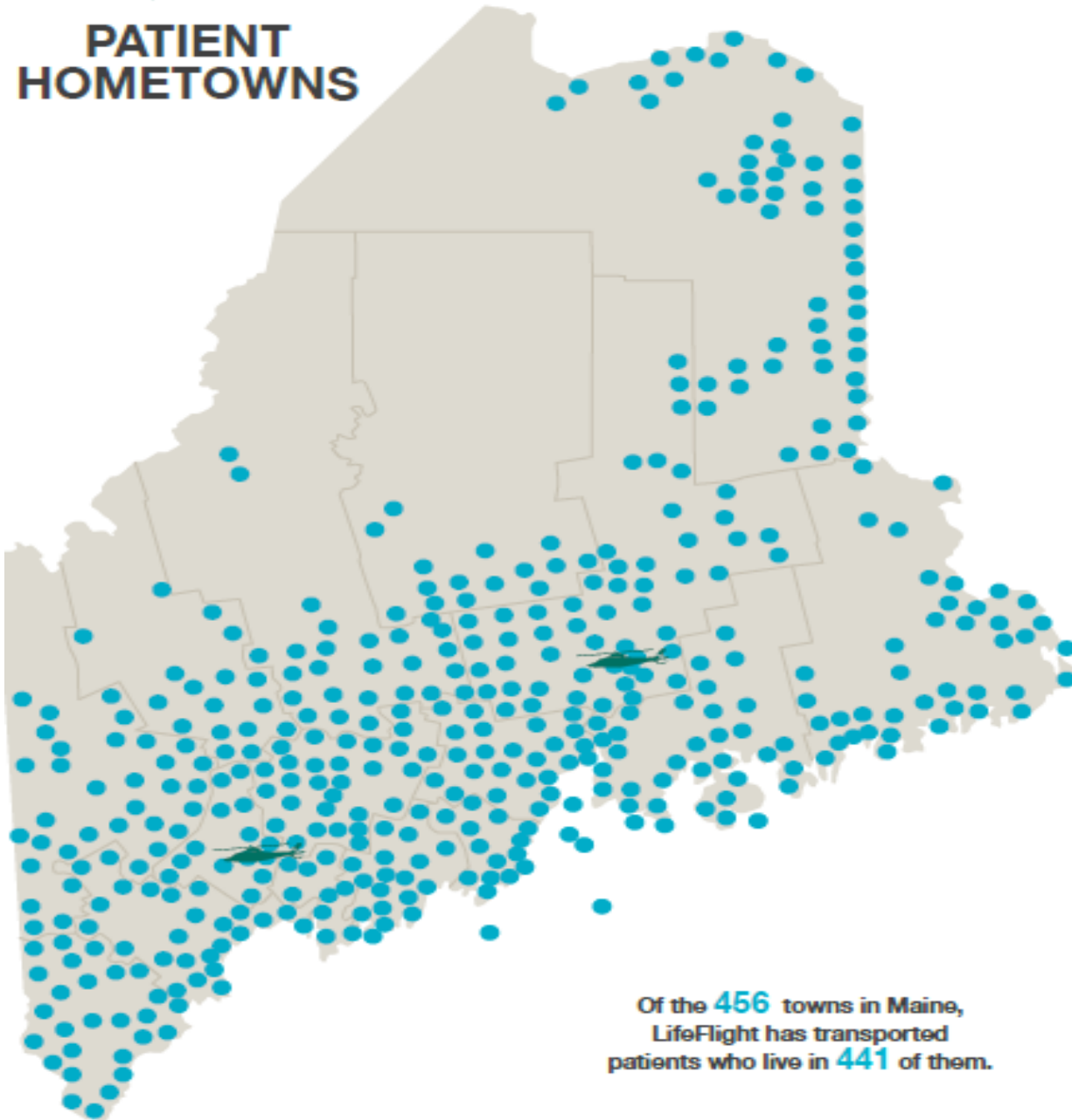


Reasons for Transport in FY15





PATIENT HOMETOWNS



Of the 456 towns in Maine,
LifeFlight has transported
patients who live in 441 of them.



Maxwell Criteria



ACCESS

State of Maine
Emergency Rendezvous Point



In case of emergency
CALL 911

GPS Coordinates:

This site maintained by:

EQUITY



EFFICIENCY



EFFECTIVENESS



Impact of Video Laryngoscopy on Advanced Airway Management (AirMED2014 Rome)

APPROPRIATE

Hindawi Publishing Corporation
BioMed Research International
Article ID 821302

Research Article

Impact of Video Laryngoscopy on Advanced Airway Management by Critical Care Transport Paramedics and Nurses Using the CMAC Pocket Monitor

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Accurate endotracheal intubation for patients in extremis or at risk of physiologic decompensation is the gold standard for emergency medicine. Field intubation is a complex process and time to intubation, number of attempts, and hypoxia have all been shown to correlate with increases in morbidity and mortality. Expanding laryngoscope technology which incorporates active video, in addition to direct laryngoscopy, offers providers improved and varied tools to employ in management of the advanced airway. Over a nine-year period a helicopter emergency medical services team, comprised of a flight paramedic and flight nurse, intended to intubate 790 patients. Comparative data analysis was performed and demonstrated that the introduction of the CMAC video laryngoscope improved nearly every measure of success in airway management. Overall intubation success increased from 94.9% to 99.0%, first pass success rates increased from 75.4% to 94.9%, combined first and second pass success rates increased from 89.2% to 97.4%, and mean number of intubation attempts decreased from 1.33 to 1.08.

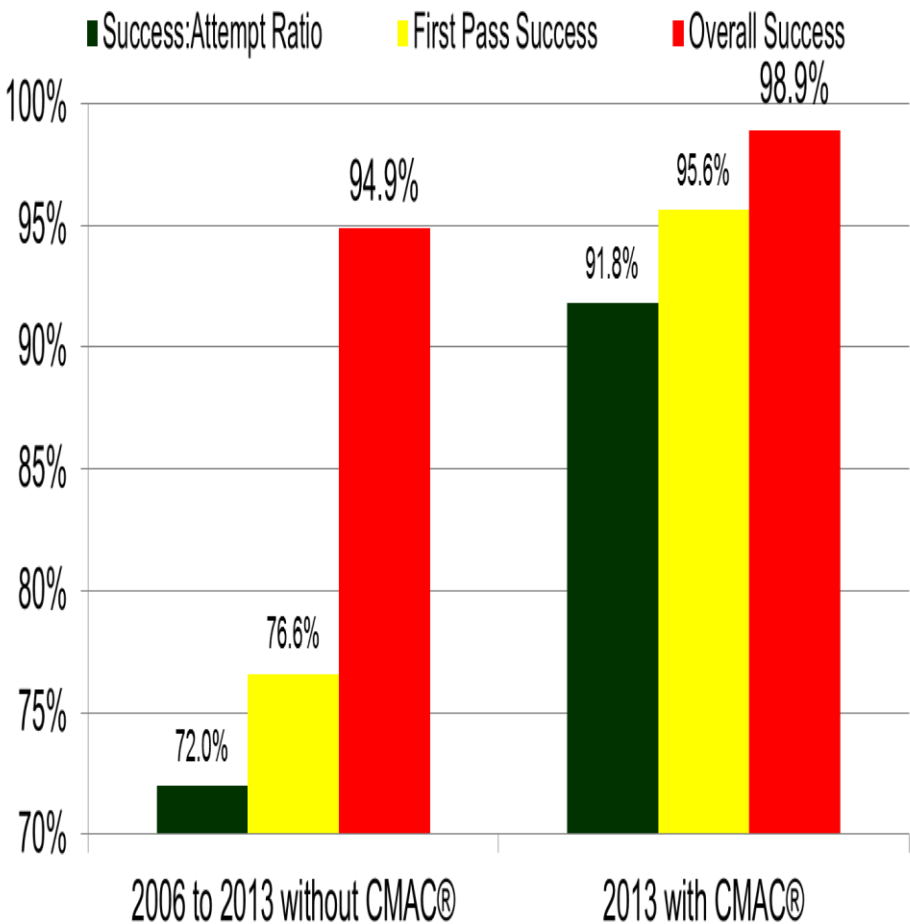
1. Introduction

Prehospital advanced airway management by paramedics and nurses has become an increasingly relevant and debated topic. Research has persistently demonstrated that failure rates of prehospital transport personnel are far higher and fraught with more complications compared to those of in-hospital personnel or physician based helicopter EMS (HEMS) colleagues [1, 2]. In cases such as cardiac arrest, recently published data is beginning to show that management with supraglottic airways or a bag-valve mask may be effective, especially in cases where immediate airway protection by endotracheal tube (ETT) is unlikely or apt to be accompanied by adverse events [3–6].

The North American HEMS crew configuration of a nurse and paramedic is atypical when compared with the international air medical industry. Research shows that

critical care flight crews in this configuration manage the airway more successfully than their ground counterparts [7] and often quite similar to that of their physician colleagues who document ETT successes of between 95% and 99.2% [8, 9]. While there is a clear correlation between successful airway management and volume of exposure, the impact of aggressive education and QI processes remain unclear [10]. Furthermore rapid sequence induction protocols appear to improve first pass success of prehospital providers [10–16], as does video laryngoscopy, especially with respect to difficult airways [17, 18]. Video laryngoscopy has demonstrated shorter entry to POGO (percentage of glottic opening) and entry to tube times, improved glottic view, and lower incidence of esophageal ETT placement [19–22].

The gold standard for successful airway management continues to be the ability to insert an ETT on the first attempt with minimal or no adverse sequelae such as hypoxia



LifeFlight of Maine Launch Decision Support Matrix, December 10, 2012 DRAFT Version 1.4

	Criteria			Action Steps		
	A	B	C	D	E	F
	*Meets Clinical Criteria for IFT STAT Launch?	MAO Required?	Bed Available?	MAO Contact Required?	Medical Director Contact Required?	Action
1	Yes	No	Yes	No	No	Launch
2	Yes	No	Unknown/ED	No	PRN	Launch. Follow-up for bed (Order: 1. TC 2. MD 3. MAO)
3	Yes	No	No	No	Yes	Launch on Medical Director approval
4	No	Yes	Yes	Yes, for medical necessity	PRN	Launch on MAO/MD approval
5	No	Yes	No	Yes, for medical necessity	PRN	Launch on MAO/MD approval and bed confirmation

***Clinical Indicators for IFT STAT Launch**

Ischemic CVA, lytic eligible

Trauma, un-stabilized or requiring immediate/imminent operative intervention

Therapeutic Hypothermia, Status Post Arrest

Sepsis

Great vessel disruption or leakage

Acutely Intubated patient

Major amputation

Major burn

ICH (Acute, with significant neurologic or life-threatening impairment)

Resuscitation/CPR in progress, medical or trauma

STEMI in need of Primary or Rescue PCI

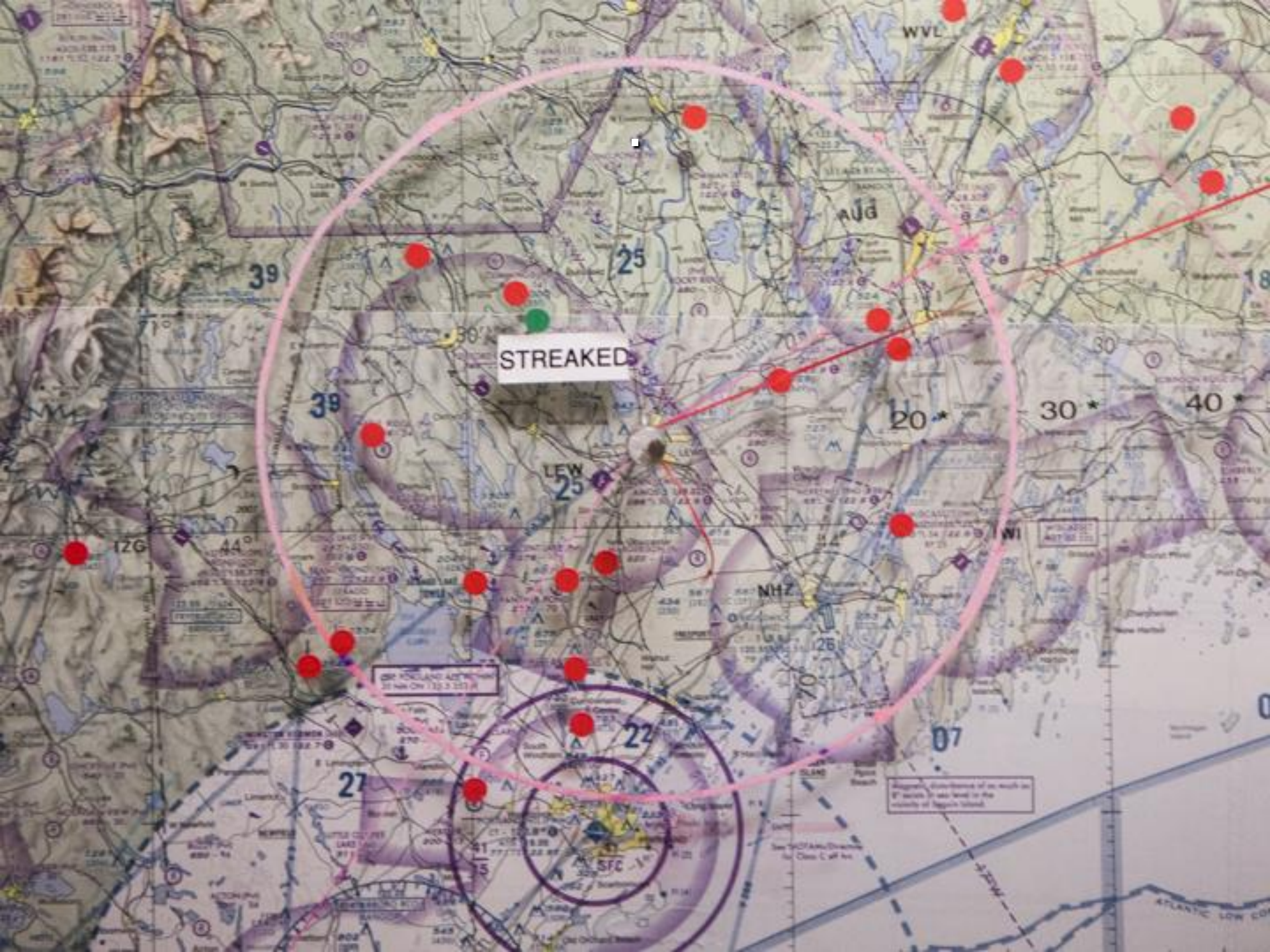


SAFE: Reliability / Trust

Amateurs talk strategy,
Professionals talk logistics

Gen. Omar Bradley





PS-RP-001 T3 R15 WELS (Northeast Carry Twp...

Name: PS-RP-001

Identifier: PS-RP-001

GPSIdentifier:

LRG Type: Remote

Status: Verified

Date Updated: 4/25/2015 13:17

LatLon	EMMC	CMMC	MMC
Lat: 4552.4200	Heading: 347.10	Heading: 29.00	Heading: 25.20
Lon: -6937.6700	Distance: 73.90	Distance: 109.22	Distance: 124.66

Convert to D M M

Address

Street Address:

Street Two:

City: T3 R15 WELS (Northeast Carry Twp or Burbank), ME

ZIP Code:

County: Piscataquis

State: ME

Description

Ed & Shirley Raymond 557-5348. Owners of the store. Maintainers of the LZ

Details

Frequency:

LOMPreset:

Surface Type:

Lit:

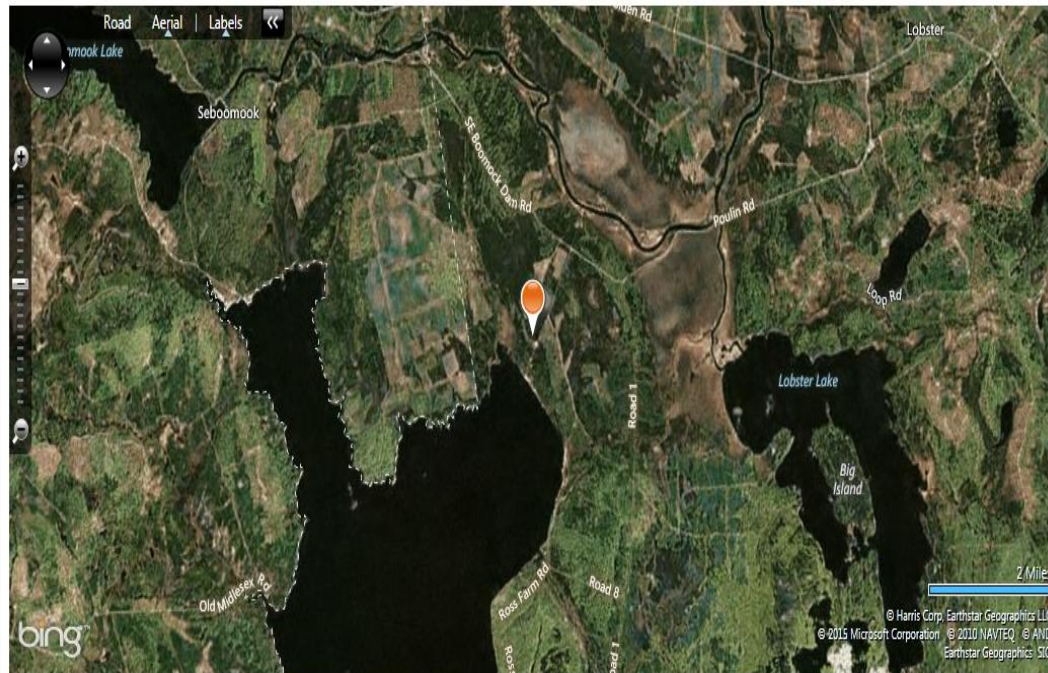
Notes Collection

Contacts Collection

Images

Notes Collection

+ - A-Z Search





HELICOPTER IFR LOW ALTITUDE GPS ROUTES







THE GEOGRAPHY OF TIME





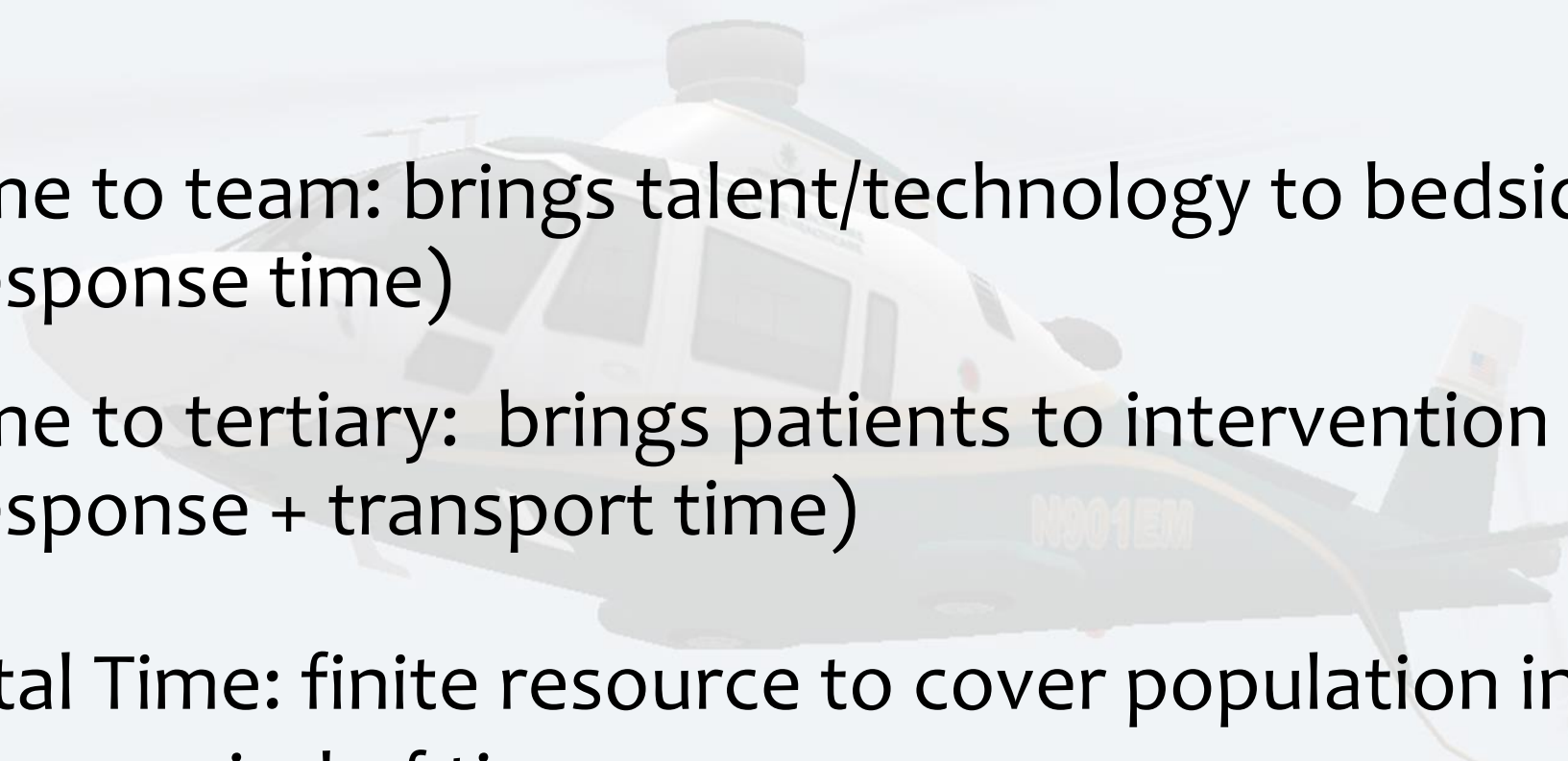








Instruments of time:

- 
- A medical helicopter, likely a LifeLink or similar emergency medical service aircraft, is shown in flight. The tail number N301EM is visible on the side. The helicopter is white with blue and yellow accents. The background is a light blue sky with some clouds.
- Time to team: brings talent/technology to bedside (response time)
 - Time to tertiary: brings patients to intervention (response + transport time)
 - Total Time: finite resource to cover population in a given period of time (total time until able to respond to next patient)

Zone 1

Northern Maine Medical Center
Cary Medical Center
The Aroostook Medical Center
Houlton Regional Hospital
Jackman Health Center
ANY Island Clinic

Zone 2

Millinocket Regional Hospital
Calais Regional Hospital
Downeast Community Hospital
Penobscot Bay Hospital
Reddington-Fairview Hospital
Mount Desert Island Hospital
Maine General Augusta
C.A. Dean Hospital

Zone 3

Blue Hill Memorial Hospital
Inland Hospital
Mayo Regional Hospital
Sebasticook Valley Hospital
Penobscot Valley Hospital
Maine Coast Memorial Hospital
Waldo County Hospital

Add Zone number to Acuity number. Any total of 4 or below is an air response.

Poor road conditions: remove 1 point for acuity level 1 and 2 patients.

J Dickson.
Draft: 9/30/2014

1

NeoRN/RN&MEDIC

Requires immediate surgical and medical intervention to enable resuscitation.

Intestinal perforation, Gastroschisis, Omphalocele, Open Myelomeningocele, Diaphragmatic Hernia. Transport to Boston/MMC for ECMO, CCHD, HIE/Cooling, Micro Preemie of <29 weeks or <1000gm. Abruptio, Cord accident, Hypovolemia, Severe RDS/MECasp, Cardiac Defect, Sepsis, PPHN

3

NeoRN/RN

-or-

NeoRN/MEDIC(flight)

Requires NICU medical intervention/Elective Transfer:

Feeding intolerance, Hypoglycemia, Preemie of >35 weeks or >2000gm R/O sepsis, Single anomaly, NAS, failed car seat test, failed Cchd screen (but stable) Hyperbilirubemia. Non emergent transport to Boston/MMC for 2nd opinions and non-emergent surgery.

2

NeoRN/RN, & MEDIC

Requires surgical and medical intervention to maintain stability.

TEF, Imperforate anus, closed Myelomeningocele, NEC, hydrocephalus Transport to Boston/MMC for PDA ligation, or other surgical intervention. 30-35 weeks or 1000-2000gm, Seizures, multiple congenital anomalies, mild RDS, metabolic crisis/disorders, Cardiac dysrhythmia, Twins or two patients at one facility

4

NEORN/MEDIC

Back transport to outlying hospital



Instruments of time:

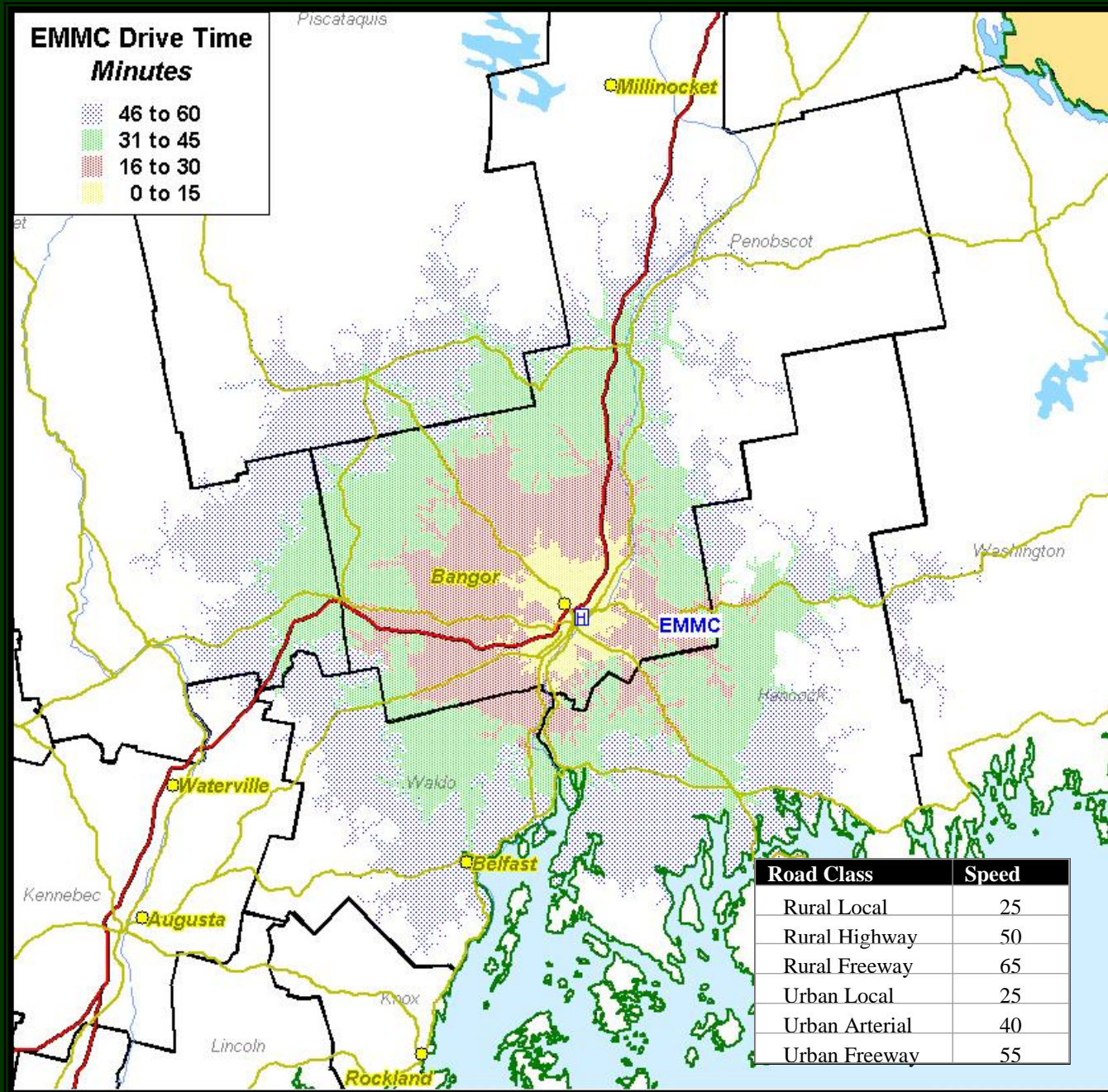
- Coverage geography of time:
- Ratio: # ground to helicopter w/ same response time: square of difference in speed.
- Ex. Avg. speed ambulance 50mph and helicopter 150mph = 1:3 – square of 3 =
- 9 ground ambulances equivalent to 1 helicopter

Decision Support Time Modeling

Input 5;

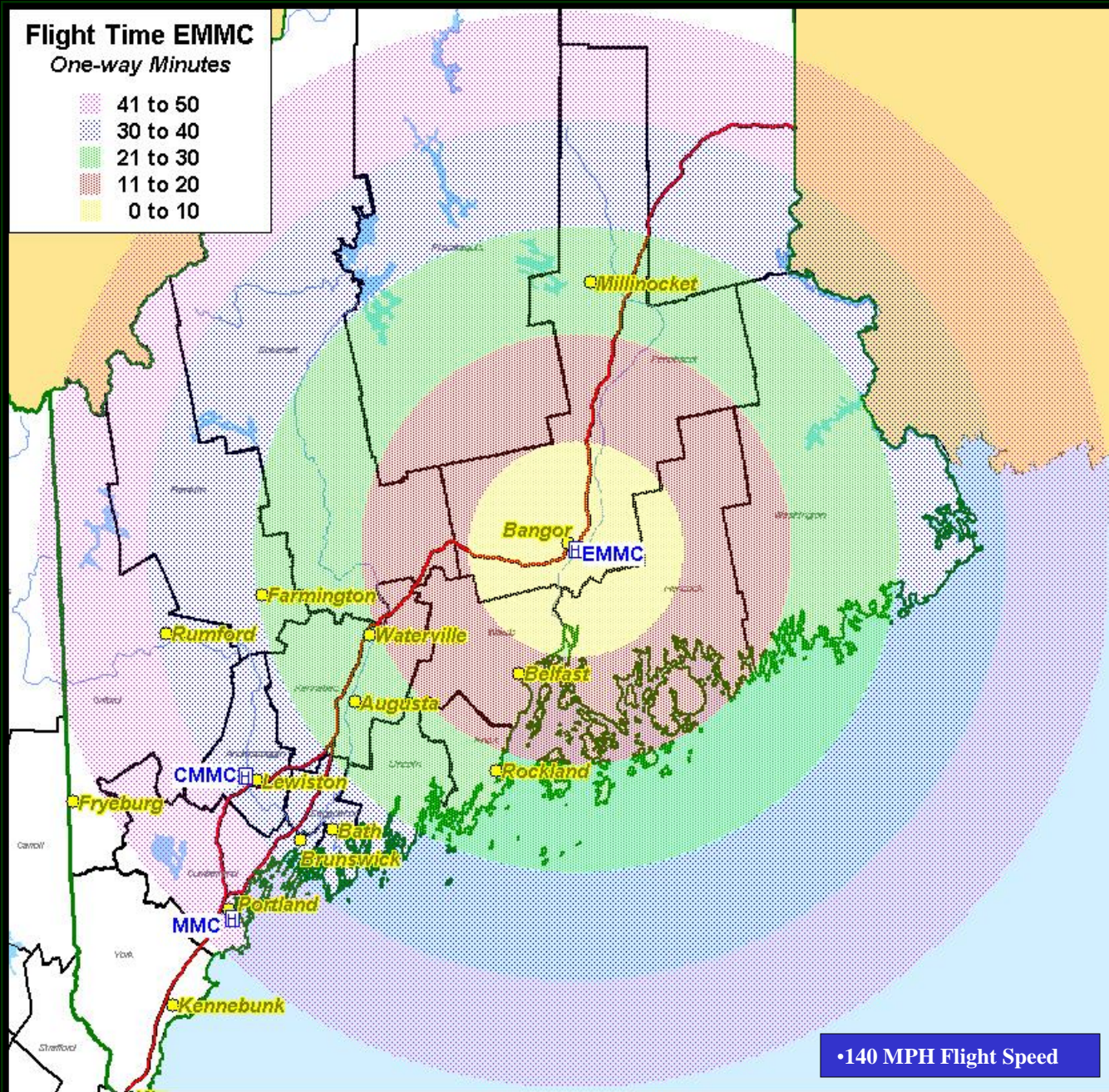
One way drive time to EMMC

Constant average speed per road classification



Flight Time EMMC One-way Minutes

41 to 50
30 to 40
21 to 30
11 to 20
0 to 10



•140 MPH Flight Speed

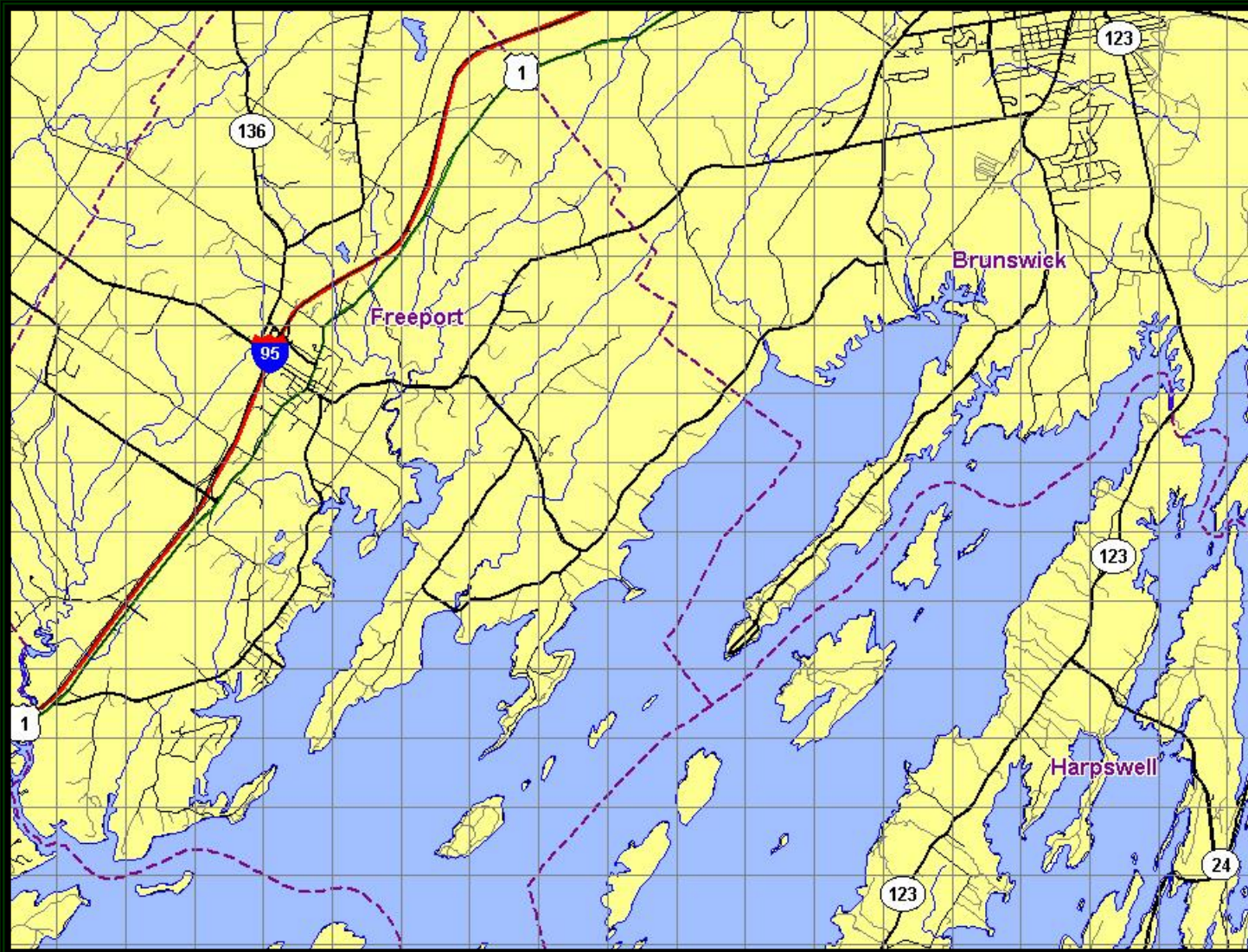
Decision Support Time Modeling

Input 6;
One way flight
time to/from
EMMC

Decision Support Time Modeling

Reference
Map

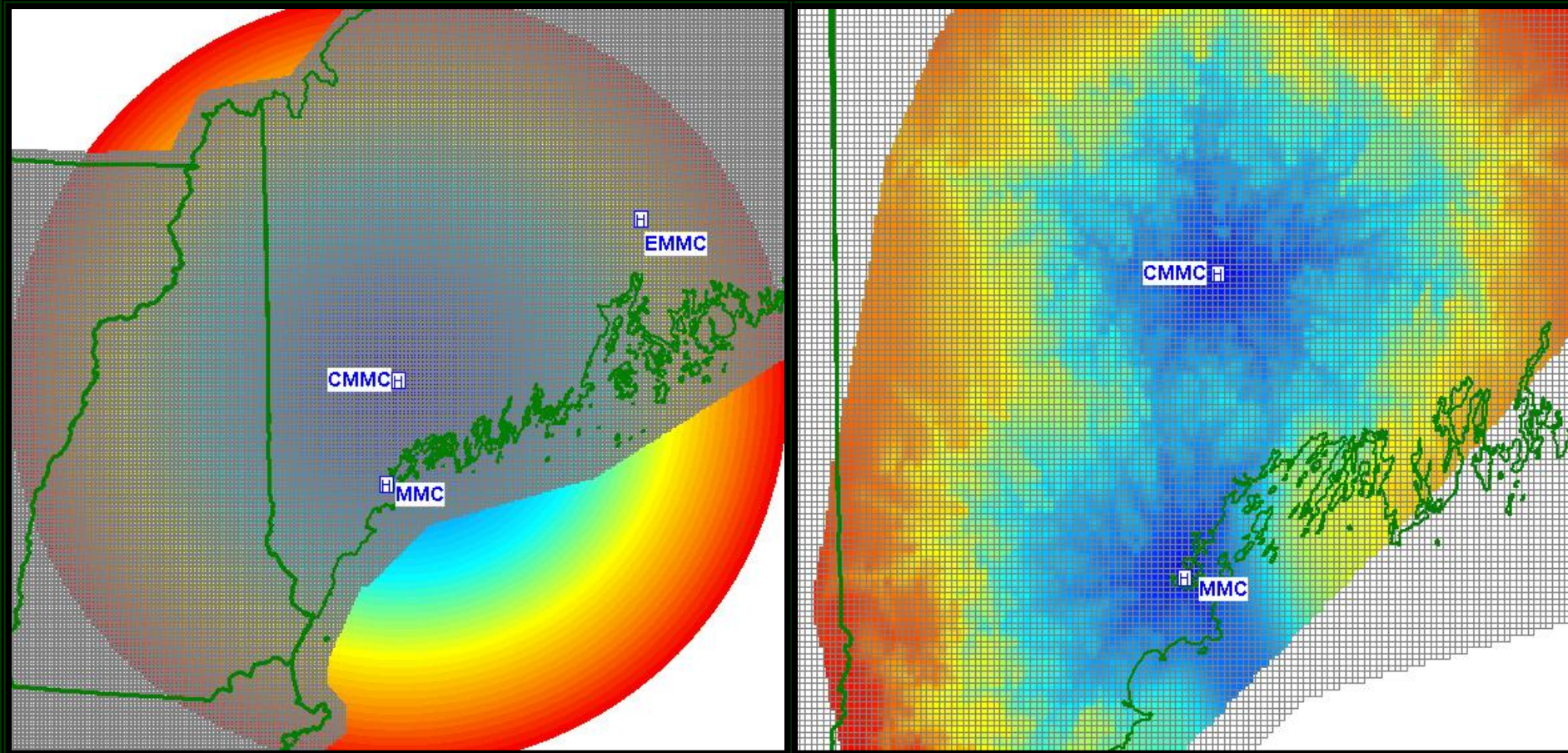
1 km grid
scale view



Decision Support Time Modeling: Assumptions for air vs. ground decision models

- Grid model:
- EMS arrival + 2 minutes = time zero
- Ground: time zero + 17 minutes + drive time to trauma center
- Air: time zero + 10 minutes launch + flight time to scene + 10 minute scene time + flight time to trauma center

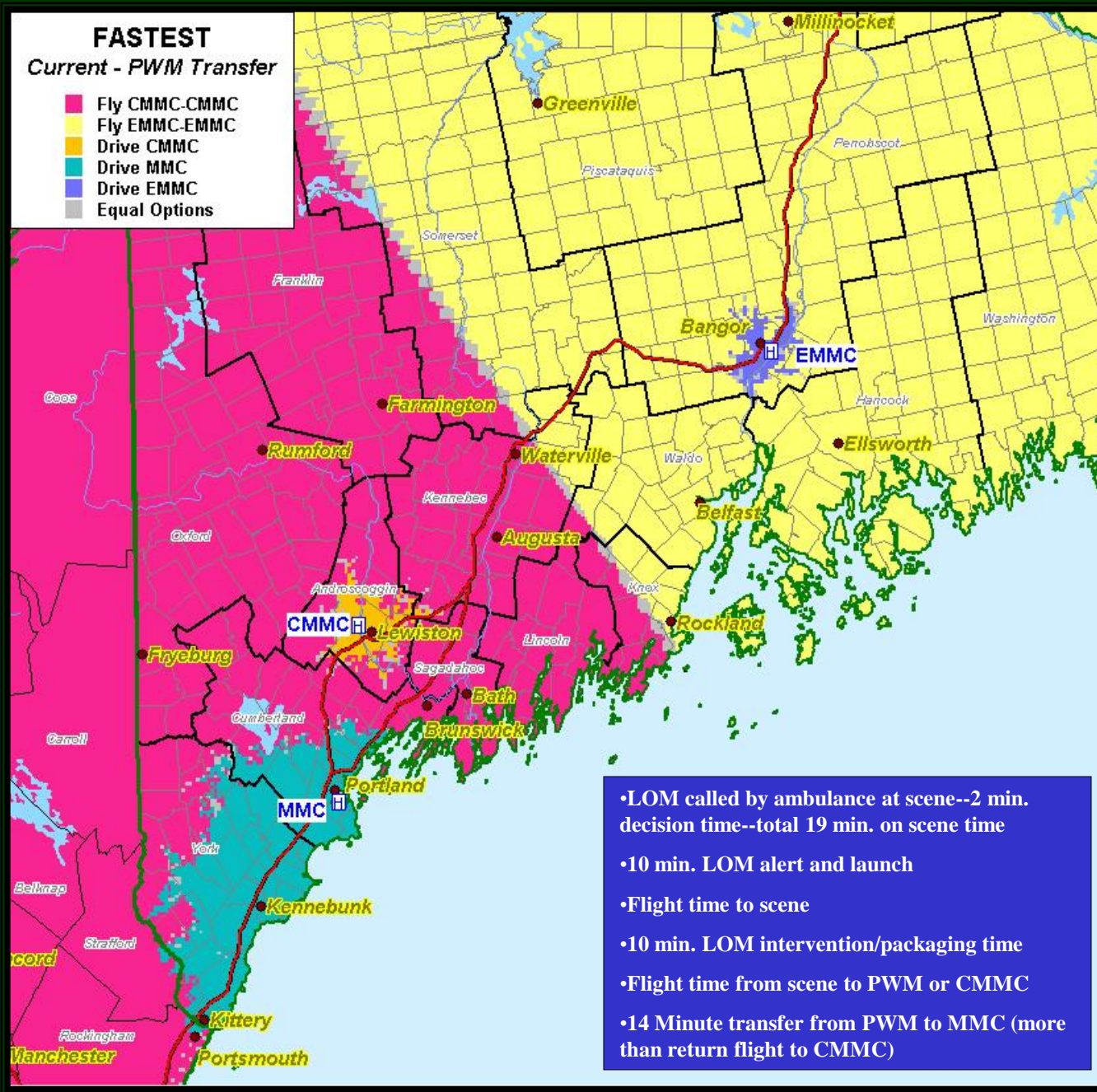
Decision Support Time Modeling



Each Value is Passed to a Grid for
Comparisons and Calculations

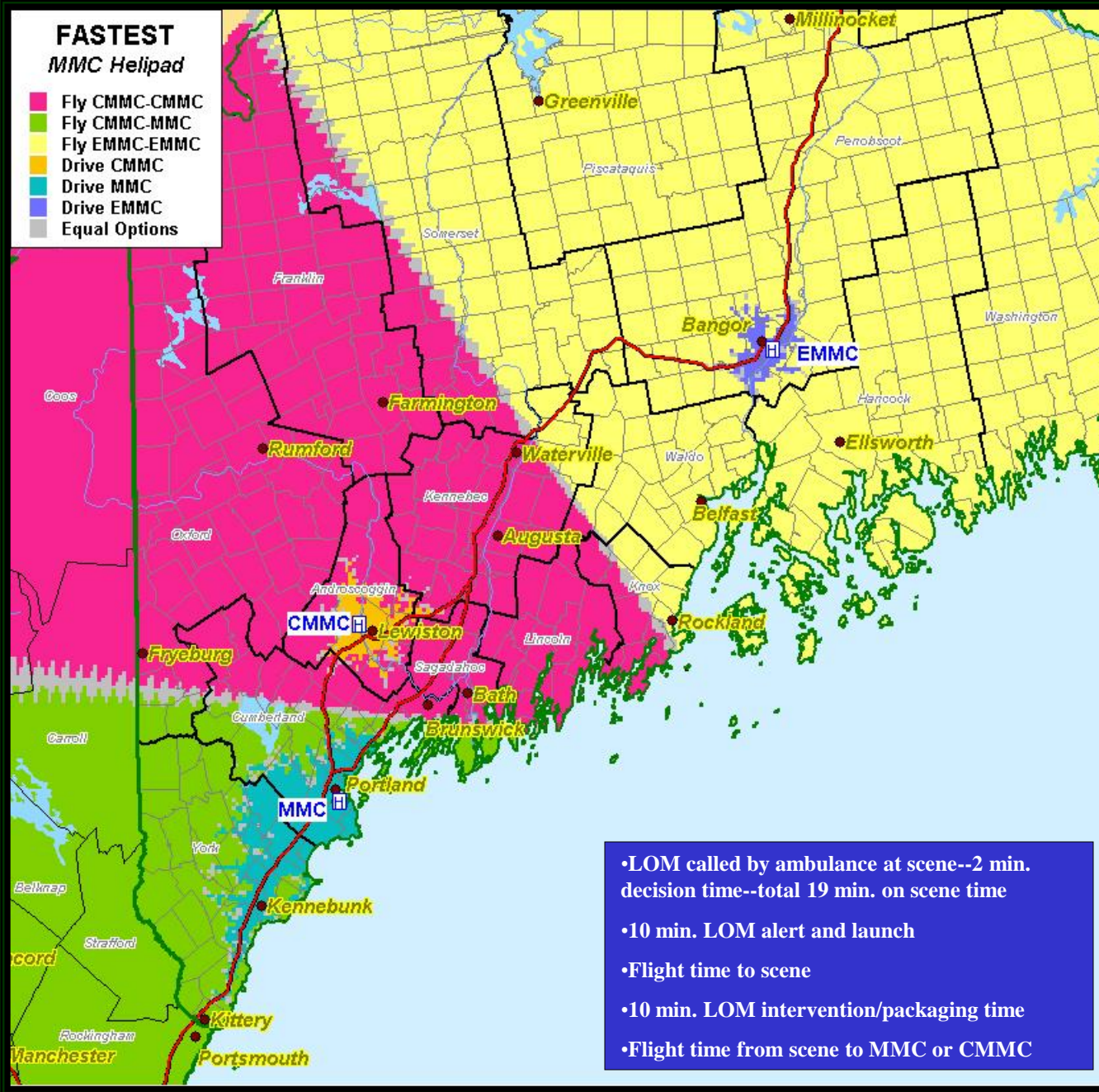
Decision Support Time Modeling

Scenario A;
Minimum
Transport Time
Current status:
no helipad at
MMC



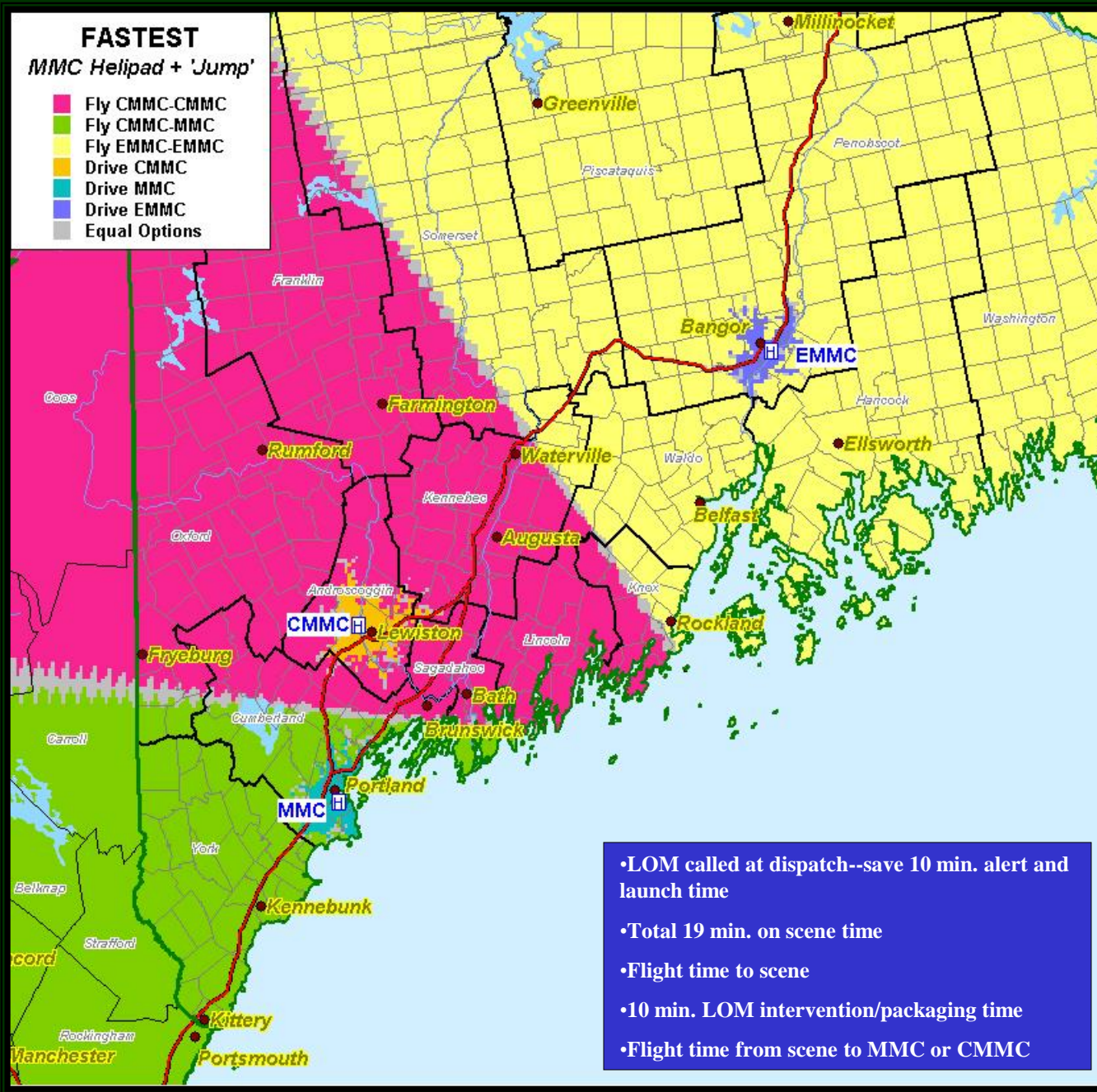
Decision Support Time Modeling

Scenario B; Helipad at MMC



Decision Support Time Modeling

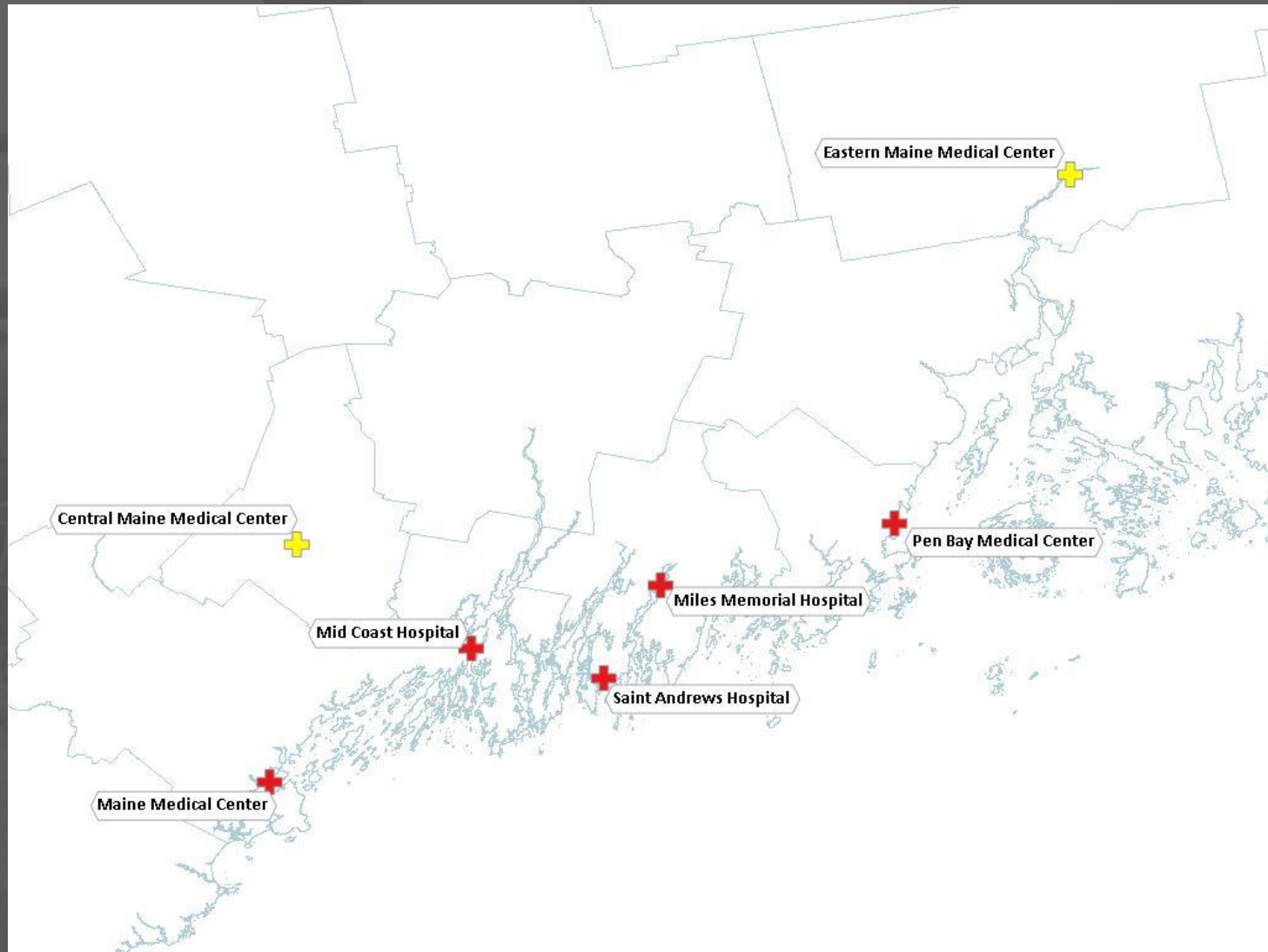
Scenario C;
Helipad at
MMC and 10
minute “Jump”
on LOM
through early
mobilization at
time of EMS
dispatch



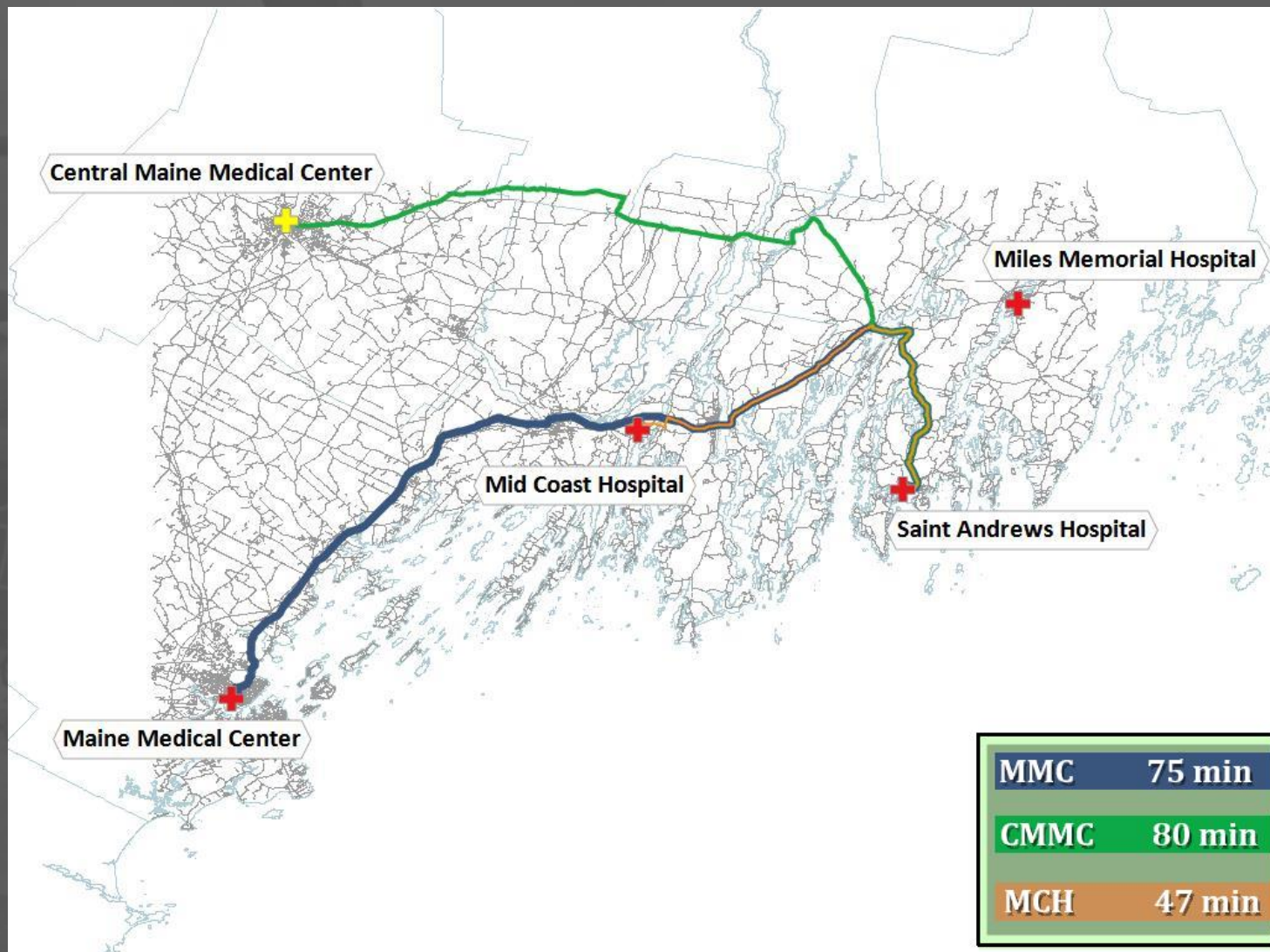


RESPONSIVENESS

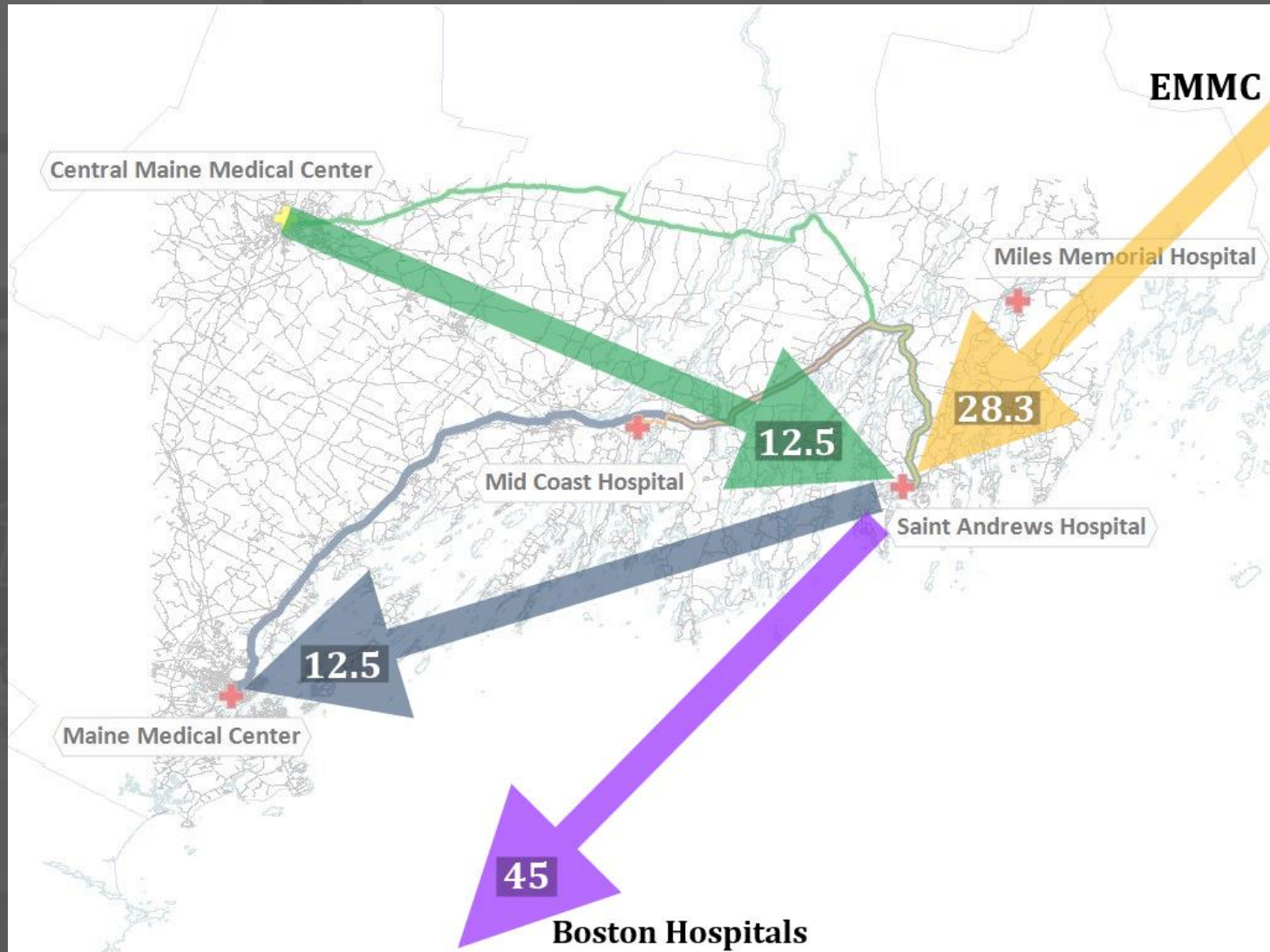
LifeFlight Current Base Configuration



Drive Times from St. Andrews Hospital

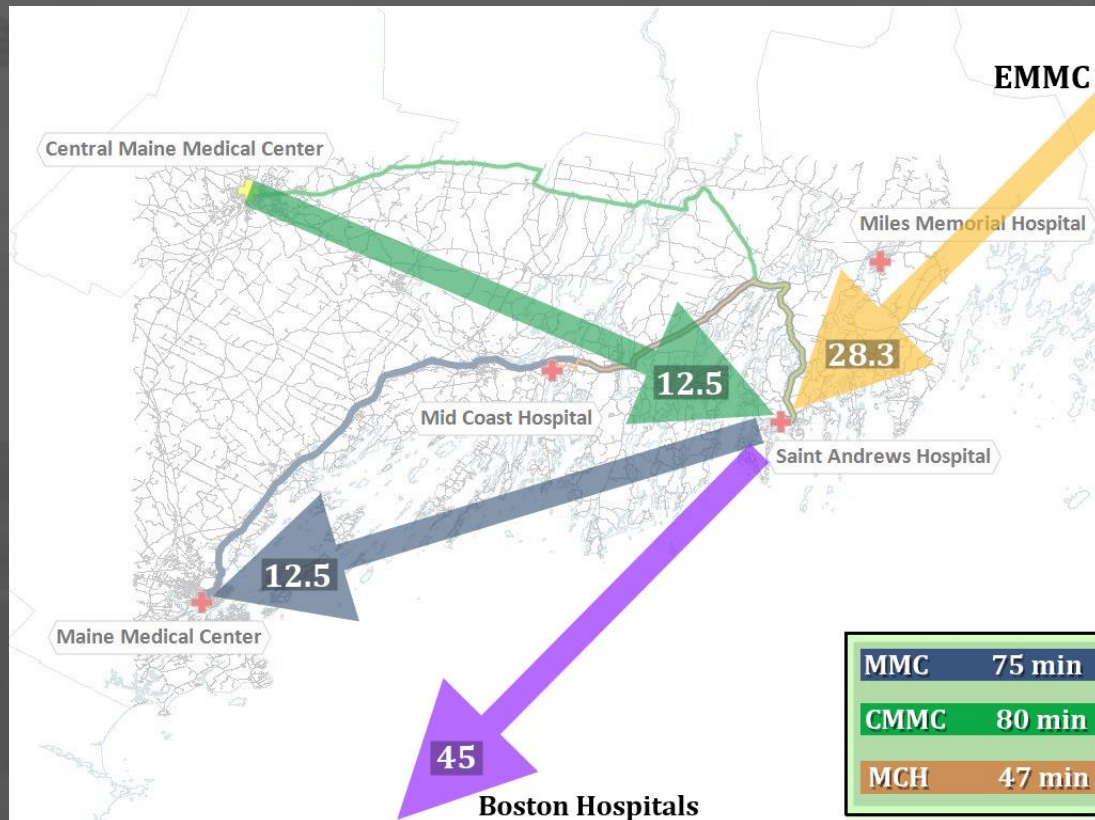


LifeFlight Response Time to Boothbay Peninsula



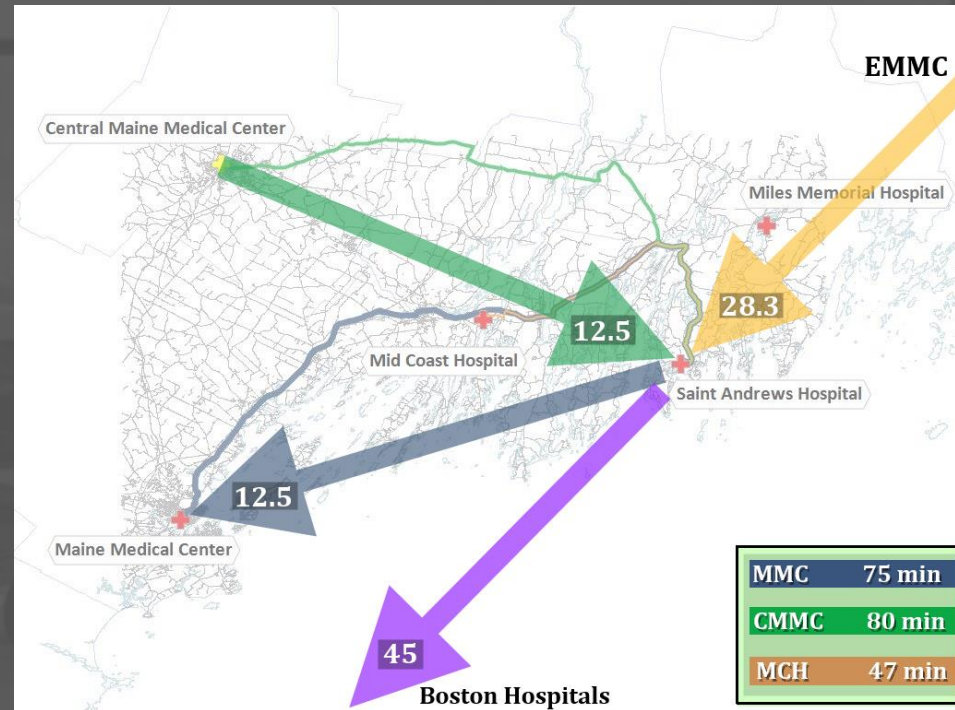
Scenario - Cardiac Patient at St. Andrew's Hospital to MMC Cath Lab

<i>* In Minutes</i>	Air	Ground
Activation	12	5
Enroute	12.5	5
Bedside	15	15
Transport	12.5	75
Total	52	100



Scenario - Juvenile with 3rd Deg. Burns on Squirrel Island to Mass General

<i>* In Minutes</i>	Air	Boat/Ground
Activation	12	5
Enroute	14	12 (Boat)
Bedside	15	15
Transport	45	12 (Boat)
Transfer	-----	15
Transport	-----	170 (Ground)
Total	76	229





Resources:

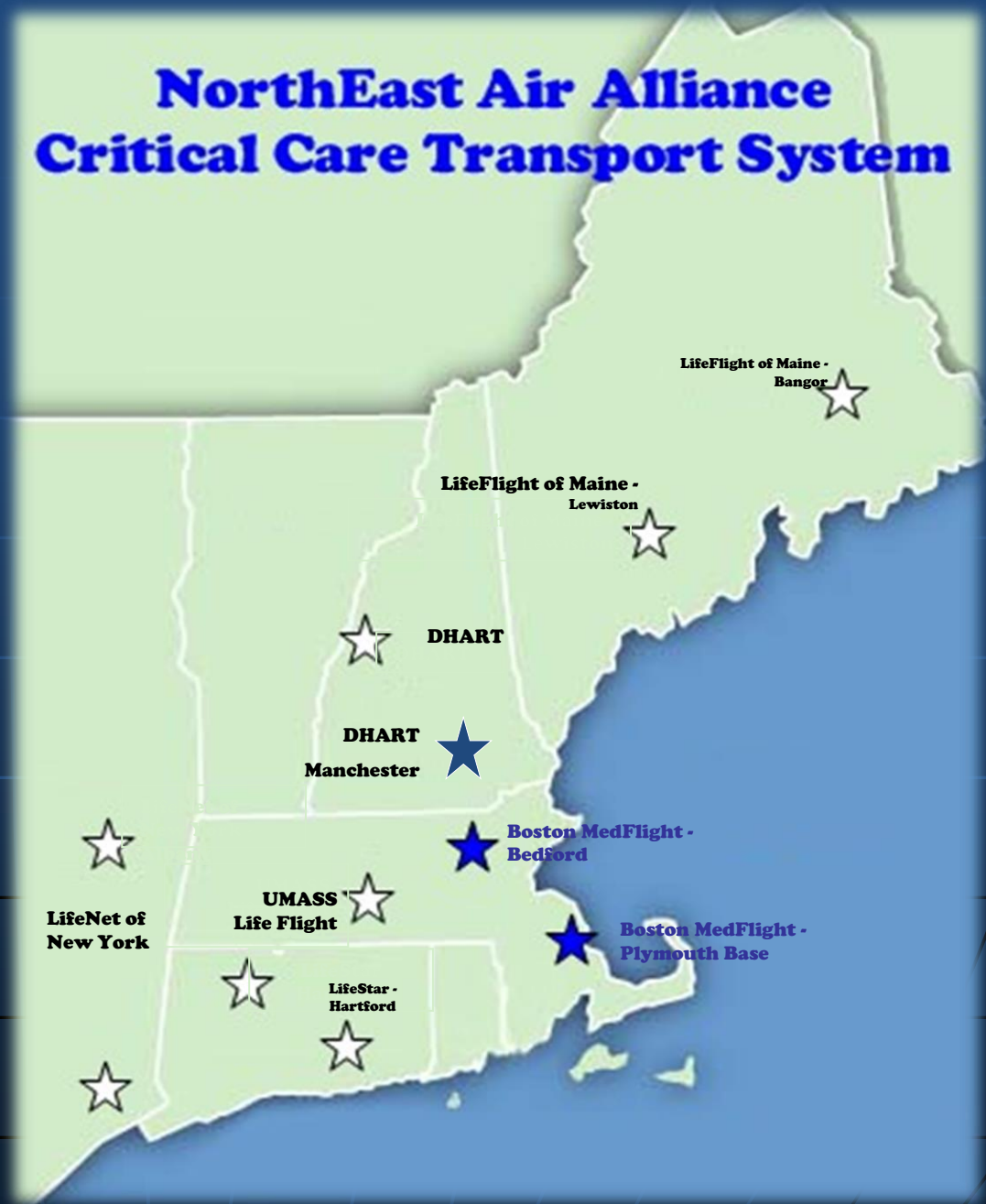
NorthEast Air Alliance Critical Care Transport System

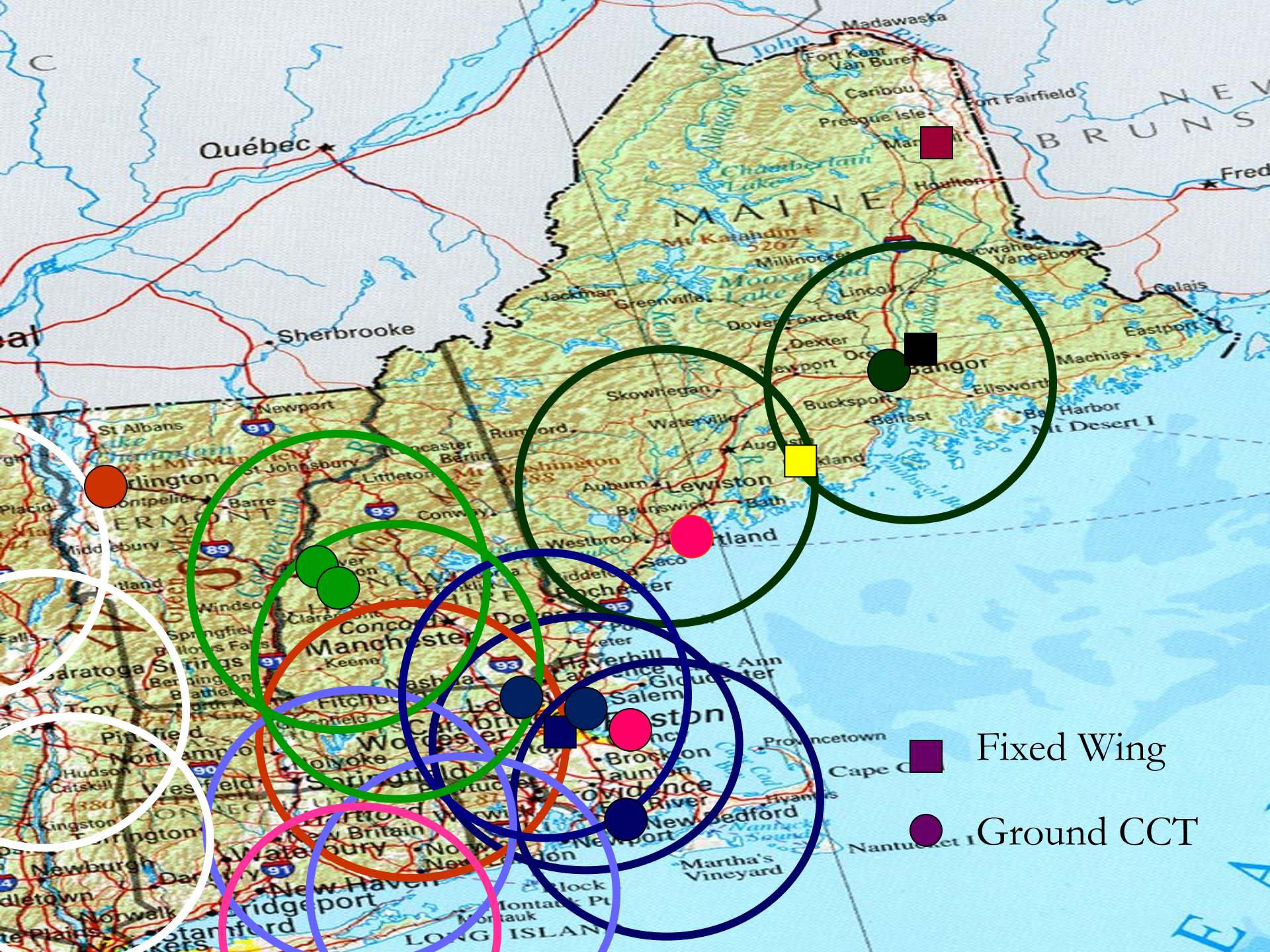
Population of New England Area:

14,238,888

**Surface Area of
New England:**

71,997 sq. miles







Operational Best Practices

Mutual-Aid/MCI

Background:

The North East Air Alliance (NEAA) was formed in 1989 as a joint venture to facilitate information exchange. Current members include Boston MedFlight, UMASS LifeFlight, Hartford Hospital LIFE STAR, LifeFlight of Maine, Dartmouth-Hitchcock and LifeNet of New York.

The mission of NEAA is to share information, discuss experiences, and encourage communications among the programs to maintain a safe and high quality regional air-medical partnership. According to that mission, the Alliance members agree to provide resources and facilities and to render services to each other when assistance is required.

Purpose:

Properly define the existing NEAA Mutual-Aid System and to standardize the agreement that has been present between the NEAA membership, thereby creating a standardized Best Operational Practice document that will be used as an additional tool by the NEAA membership and their Communication Centers.

NEAA MCI

- Event: Regional critical care response needed: Station Night Club West Warwick, RI
- Primary service requests NEAA support
- Primary service coordinates staging, communications, and ground LZ
- Distribution of patients across NE
 - 10 RW
 - 2-3 FW
 - 6 GCCT

LifeFlight of Maine



Eastern Maine Healthcare Systems Central Maine Healthcare LifeFlight Foundation

LifeFlight of Maine

- Statewide communications/ MedComm
- L1 EMMC (RW)
- L2 CMMC (RW)
- L3 BIA (FW)
- GCCT/ Meridian (Bangor)
- GCCT / United (Lewiston / weather)
- L4
- IFR
- Blood Yes



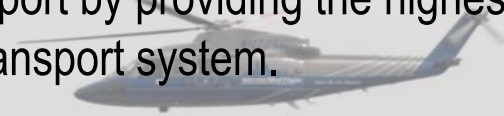


LifeFlight of Maine

- “Eye in sky”
- Search support --Coordination MWS, MSP, 126th, DOC
- LRG with PSAP's
- Immediate team / technology
- Triage Support / Additional Med Personnel
- Specialty Medication Stockpile Distribution
- Resupply— personnel / medical supplies
- Blood resupply

Boston MedFlight Consortium

Commits to excellence in critical care transport by providing the highest quality regional critical care transport system.



Beth Israel Deaconess Medical Center

Boston Medical Center

Brigham & Women's Hospital

Children's Hospital Boston

Massachusetts General Hospital

Tufts Medical Center



Beth Israel Deaconess
Medical Center



Tufts Medical
Center

Boston MedFlight Fleet



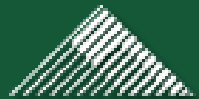
Boston MedFlight

- Lawrence Airport RW/ GCCT 12 Hr.
- Hanscom AFB RW/ FW / GCCT
- Plymouth Airport RW / GCCT
- Time to LA Airport Staging- 46, 55, 69 min.

- LOM Dispatch Console Integrated
- IFR
- Blood No

DHART

Dartmouth Hitchcock Advanced Response Team



DARTMOUTH-HITCHCOCK MEDICAL CENTER

DHART

- DHMC Lebanon, RW/2x GCCT
- Manchester Airport RW
- Time to LA Airport staging 44-47 min.
- DHARTCOMM uses LOM Mt. Washington
- IFR
- Blood Yes

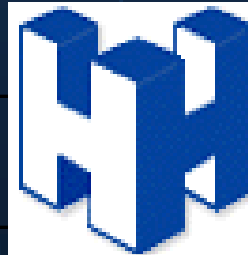
UMass Memorial *LIFE FLIGHT*



UMass Memorial Life Flight

- Worcester MA RW
- Time to LA Airport 70 min.
- VFR
- Blood- No

LIFE STAR



HARTFORD
HOSPITAL

LIFE STAR

- Midstate MC, Meridian RW
- Backus Hospital, Norwich RW
- Time to LA Airport Staging 85, 93 Min.
- VFR
- Blood YES

Life Net of New York



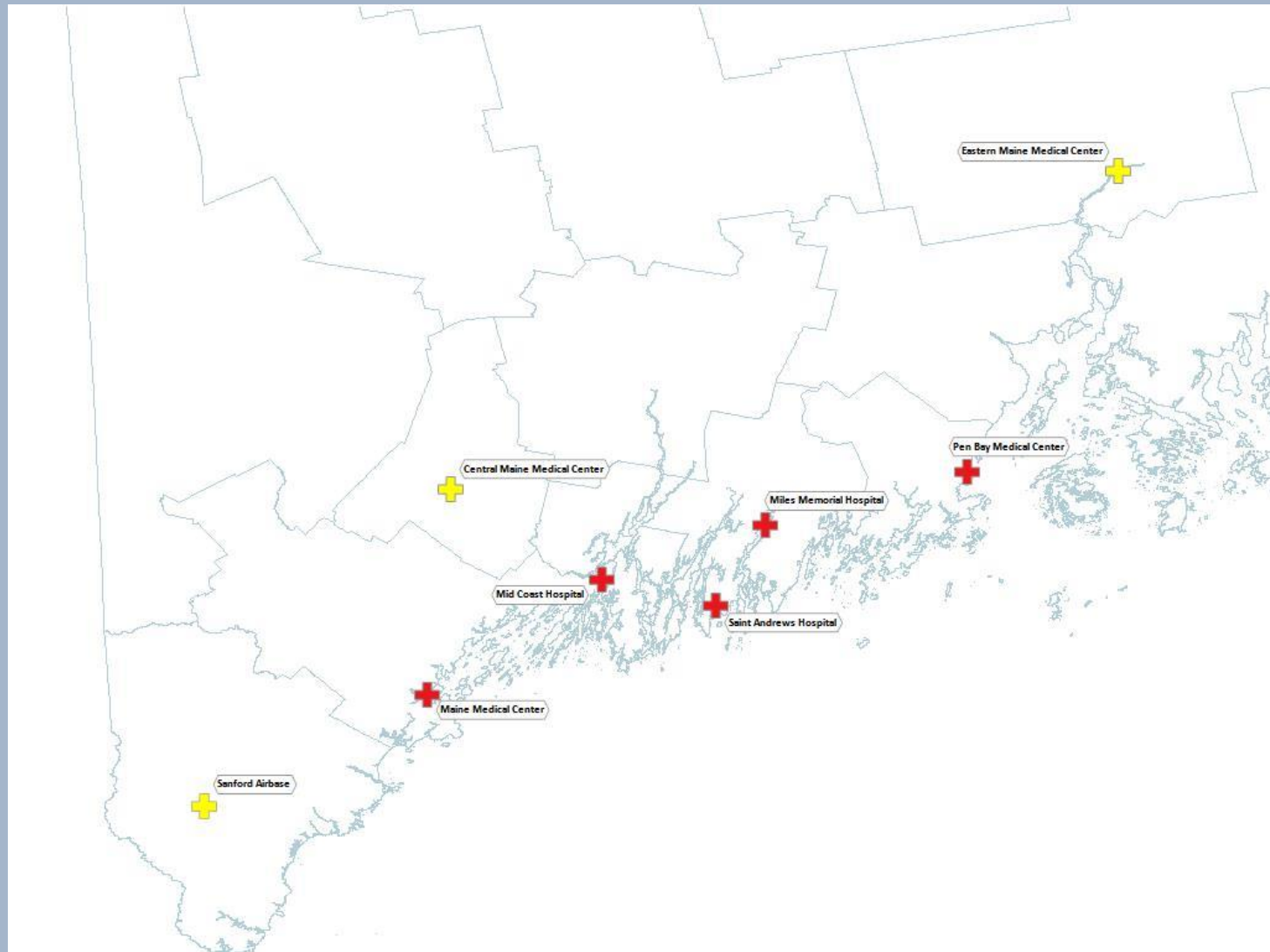
Life Net of New York

- 10 Bases--- Westchester / Albany
- Back coverage for DHART, LifeSTAR, UMASS LifeFlight, and Boston MedFlight
- VFR
- Blood No

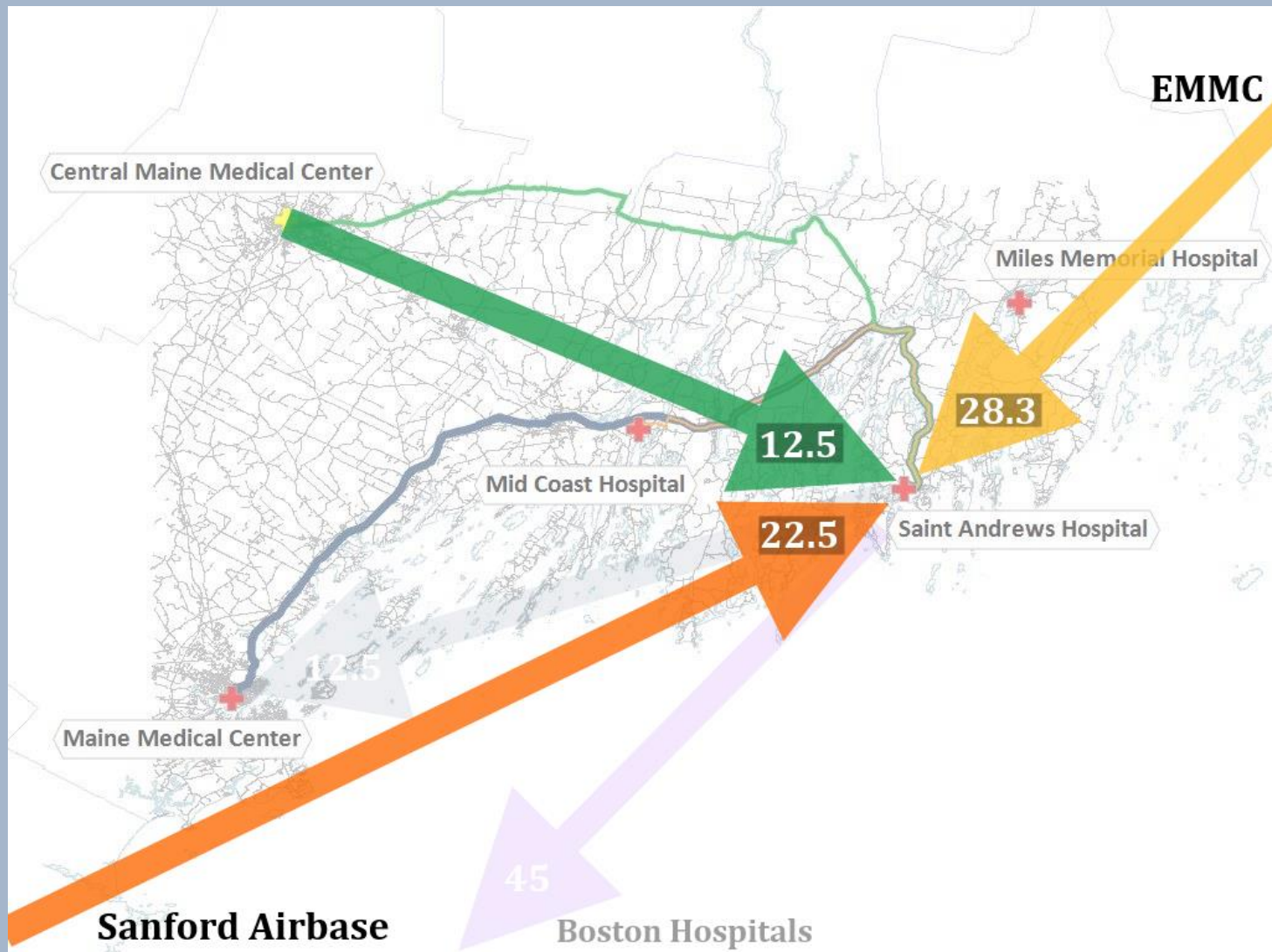
Future:



LifeFlight Proposed 3 Aircraft Base Configuration



LifeFlight Proposed 3 Aircraft Response Times



Bonnie

Snowmobile accident survivor



*“Knowing is not enough,
we must apply,
Willing is not enough,
we must do.”*

Goethe

Epigraph IOM “EMS at the Crossroads”

